Wucheng Sun

PHD STUDENT

Profile

I am a **2nd year PhD student**, majoring in **Geological Engineering**, and I am doing my research around the topic of **deep, hard rock drilling** with diamond bits. My research interest is to analyze the **wear and thermal damage of drilling tools** by computer vision and data analysis methods based on **deep learning**.

I have published my work about detection, evaluation and prediction of matrix wear based on SEM images. Besides, subsequent research on diamond thermal damage is in progress. Furthermore, my research is intended to be extended to sequential data later, involving drilling parameters and **acoustic emission** signals.

I am working on a project called ***Study on the wear behavior of hot-pressed WC-Cu based impregnated diamond bit under hydraulic percussive-rotary drilling condition***, based on which I would complete my doctoral program.

Education

Bachelor of Engineering, China University of Geosciences

SEPTEMBER 2014 — JUNE 2018

- Got the university-level outstanding undergraduate thesis award (5%): ***Application of UFD theory and optimization of fracturing parameters in low permeability reservoir*** (Undergraduate thesis about hydraulic fracturing)

Master of Engineering, China University of Geosciences

SEPTEMBER 2018 — JUNE 2020

- Worked for a collaborative project about Green exploration in hydrogeological drilling: ***Development and application of automatic mud circulation purification device for green exploration hydrogeological drilling*** (Project)

PhD of Engineering, China University of Geosciences

SEPTEMBER 2020 — PRESENT

- Working for a NSFC (National Natural Science Foundation of China) project about wear of diamond bits: ***Study on the wear behavior of hot-pressed WC-Cu based impregnated diamond bit under hydraulic percussive-rotary drilling condition*** (Project).

Publication

[1] Chai, X., Sun, W., Duan, L., Dong, G., Zang, L. (2019). Design and Development of Mechanical System for an Automatic Mud Circulation and Purification Device[J]. Metal Mine, 48(07): 182-188. (Chinese)
http://doi.org/10.19614/j.cnki.jsks.201907030

[2] Wang, Z., Fang, X., Sun, W., Duan, L., & Tan, S. (2021). D-Optimal Mixture Design of Fe-Based Pre-Alloyed Diamond Bit Matrix with Low Liquid Phase Content. *Journal of Superhard Materials*, *43*(4), 265-277.
http://doi.org/10.3103/S1063457621040080

[3] Sun, W., Gao, H., Tan, S., Wang, Z., & Duan, L. (2021). Wear detection of WC-Cu based impregnated diamond bit matrix based on SEM image and deep learning. *International Journal of Refractory Metals and Hard Materials*, *98*, 105530.
https://doi.org/10.1016/j.ijrmhm.2021.105530

Details

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NATIONALITY

Chinese

Areas & Skills

- Powder Metallurgy
- Friction & Wear
- Deep Learning
- Data Analysis
- Python

Languages

- Chinese (Native)
- English (IELTS = 7.0)

Personal Website

https://sunwucheng.com